

***EUPHORBIA ABRAMSIANA* (EUPHORBIACEAE): NEW TO TEXAS**

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ABSTRACT

Euphorbia abramsiana L.C. Wheeler is a prostrate annual found throughout southern California, Arizona, the southwest corner of New Mexico, and adjacent Mexico. This report documents its occurrence in trans-Pecos Texas. Misidentified *E. abramsiana* specimens, mostly confused with *E. glyptosperma* and *E. serpyllifolia*, have been found from locations mainly in and near Big Bend National Park and Big Bend Ranch State Park. *Euphorbia abramsiana* differs from *E. glyptosperma* and *E. serpyllifolia* by the presence of very short, stiff hairs on the stems, distinct pale lines following the pattern of the pinnate venation on the leaf blades, leaf blade maculation consisting of a series of spots along and near the midvein, and an abrupt protrusion on the chalazal end of the seed.

Euphorbia abramsiana L.C. Wheeler (subg. *Chamaesyce* sect. *Anisophyllum*) is a prostrate desert annual (Fig. 1) previously known from southern California, Arizona, the southwestern corner of New Mexico, and adjacent Mexico. The species is now documented for Texas, represented by eight specimens in the Sul Ross State University Herbarium (SRSC) and two from the University of Texas herbarium (TEX-LL). All were collected in and near Big Bend National Park (BBNP) and Big Bend Ranch State Park (BBRSP), with one seemingly out-of-place record in Reeves County (Fig. 3).

Texas specimens of *Euphorbia abramsiana* examined. Reeves Co.: Frequent annual; limestone soil along highway about 15 mi S of Pecos toward Saragosa, alt. 457 m, 9 Sep 1951, *Warnock 10181* (TEX-LL). Presidio Co.: BBRSP, Terneros Creek crossing on road to Saucedo, 579814 E, 3269720 N, alt. 920 m, 30 Sep 2014, *Morey 207* (SRSC); BBRSP, Madera Canyon River Access, near 605018 E, 3240801 N, alt. 720 m, 22 Sep 2014, *Morey 197* (SRSC; Fig. 1); BBRSP, 1 mi W of Lajitas on Rio Grande, 616973 E, 3237502 N, 710 m, 23 Sep 2014, *Morey 198* (SRSC); 6.1 km N of Presidio on Hwy 67, 4 Sep 1999, *McRae 41* (SRSC). Brewster Co.: BBNP, Mesa de Anguila Trail, off trail just E of Comanche Creek, 27 Sep 2014, *Morey 203* (SRSC); BBNP, frequent annual on sandy soil at head of Boquillas Canyon, alt. 579 m, 12 Aug 1966, *Warnock 20951* (SRSC); BBNP, gravel-topped yellow marl hills near San Vicente, 29°9' x 103°1', alt. ca. 579 m, 16 Nov 1958, *Johnston 3625* (SRSC); BBNP, infrequent annual in limestone soil in Avery Canyon, alt. 975 m, 23 July 1950, *Warnock 9135* (SRSC); BBNP, muddy banks of Rio Grande near San Vicente, 26 Aug 1915, *Young s.n.* (TEX-LL).

Description of Texas specimens of *Euphorbia abramsiana*. Prostrate to ascending annual; stems pubescent with very short, stiff hairs, at least basally, often glabrous toward the apices; leaf blades oval to oblong, oblong-ovate, oblong-lanceolate (often the short side is semi-oval and the long side is semi-oblong), to 10 mm long, 4 mm wide, sometimes pubescent, bases unequal; blades green in shade to dark green in bright sunlight in living plants, with pale stripes following the pattern of the

pinnate venation (though not veins themselves; stripes fade after blades dry); blade maculation comprised of a series of spots, usually of different sizes, arranged along and near the midrib (spots sometimes branching or merging to form an irregular shape), or occasionally 1 or a few spots along and near major veins away from the midrib; blade margins entire to toothed at the apex and along the long side of the margins; stipules divided several times into filaments; cyathia solitary at the nodes; involucre glands mostly circular, occasionally oblong, with appendages entire to bilobed; involucre lobes between glands usually divided into a few segments; staminate flowers 3–5; styles divided and short; capsules globose triangular, slightly elongated, 1.8 mm long, 1.5 mm wide, glabrous; seeds quadrangular in cross section, white, 1.2–1.3 mm long, ca. 0.5 mm wide, with markedly raised, rounded transverse ridges, with the angles appearing entire or inconspicuously notched between some transverse ridges, the transverse ridges appearing mostly continuous with the angles, and the chalazal end of the seed with an abrupt protrusion, less than 0.1 mm long.

The description above of *Euphorbia abramsiana* is mostly consistent with others published for the species (Jercinovic 2007; Wheeler 1934; Wheeler 1941), but we have provided more details here on leaf morphology and seeds. Steinman and Felger (1997) described minute teeth on the margins of the leaf blade large enough to be seen only with aid of magnification, compared to *E. serpyllifolia* with conspicuous teeth often large enough to be seen without magnification. We find that *E. abramsiana* can have larger teeth than *E. serpyllifolia*, albeit rarely. Apart from some specimens with relatively deep incisions between the teeth, the Texas specimens cited above display all other characters of *E. abramsiana*. The Texas specimens also look very similar to an isotype (Abrams 4097, MO, digital image via tropicos.org).



Figure 1. *Euphorbia abramsiana*. Morey 197, Madera Canyon River Access, Big Bend Ranch State Park, Texas, 22 Sep 2014. Photo by Roy Morey, used with his permission.

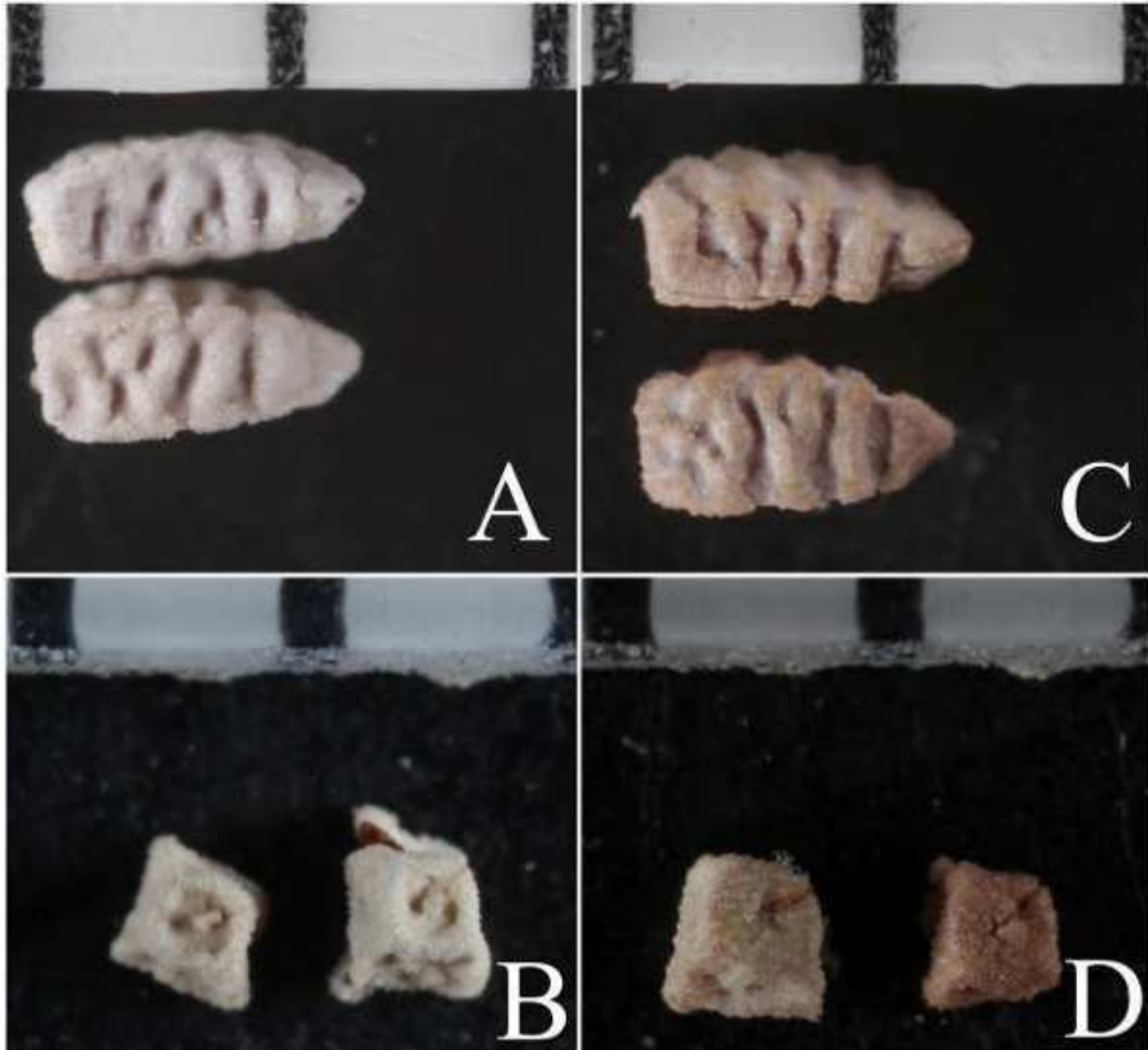


Figure 2. A. *Euphorbia abramsiana* seeds have transverse ridges appearing mostly continuous with the rest of the seed; angles (four corners of seeds in cross section) less noticeably notched between ridges (Warnock 9135, SRSC). B. Chalazal end of *E. abramsiana* seed showing a protrusion often visible from the side of the seed (Warnock 9135, SRSC). C. *Euphorbia glyptosperma* seeds have transverse ridges that appear distinct from the areas between notches and often appear as a slightly different color; angles noticeably notched between ridges (Warnock & Parks 8762, SRSC). D. Chalazal end of *E. glyptosperma* seed mostly flat or only slightly bulging and not typically visible from the side of the seed (Warnock & Parks 8762, SRSC). Seed differences between *E. abramsiana* and *E. glyptosperma* are somewhat inconsistent in ridge characters but consistent in characters on the chalazal end of seeds, at least in specimens collected in the Trans-Pecos. Scale in millimeters.

The *Euphorbia abramsiana* specimens from Texas were previously identified as *E. glyptosperma* (Fig. 5), *E. serpyllifolia* (Fig. 6), and one as *E. golondrina*, with four specimens bearing annotations by M.C. Johnston. Johnston annotated these specimens as “atypical” and belonging to *E. glyptosperma*. Correll and Johnston (1970) similarly noted that some “aberrant” specimens of *E. glyptosperma* are pubescent. *Euphorbia glyptosperma* and *E. serpyllifolia* are both common throughout trans-Pecos Texas. *Euphorbia glyptosperma* is found throughout Texas except in the eastern part of the state (Fig. 3) and seems to prefer sandy, disturbed soils, whereas *E. serpyllifolia* is seemingly restricted to the Trans-Pecos and is found mostly in rocky soils. In the USA as a whole, *E. glyptosperma* and *E. serpyllifolia* are reported throughout except the southeastern states (even

entering Canada). *Euphorbia golondrina* is restricted to trans-Pecos Texas and is much less widespread, apparently confined to certain sandy habitats. *Euphorbia abramsiana*, *E. glyptosperma*, *E. serpyllifolia*, and *E. golondrina* are sympatric in trans-Pecos Texas.

Many *Euphorbia glyptosperma* specimens from the Trans-Pecos differ slightly in certain characters from *E. glyptosperma* specimens from other parts of Texas (Fig. 5). In many Trans-Pecos specimens of *E. glyptosperma* the seeds are longer, the leaf blades are usually more oval, bases of blades are less unequal, the cyathial glands are more circular, and the glandular appendages are more often 2-lobed. All these traits approach those of *E. abramsiana*, suggesting hybridization between these two species in the Trans-Pecos region where they are sympatric.

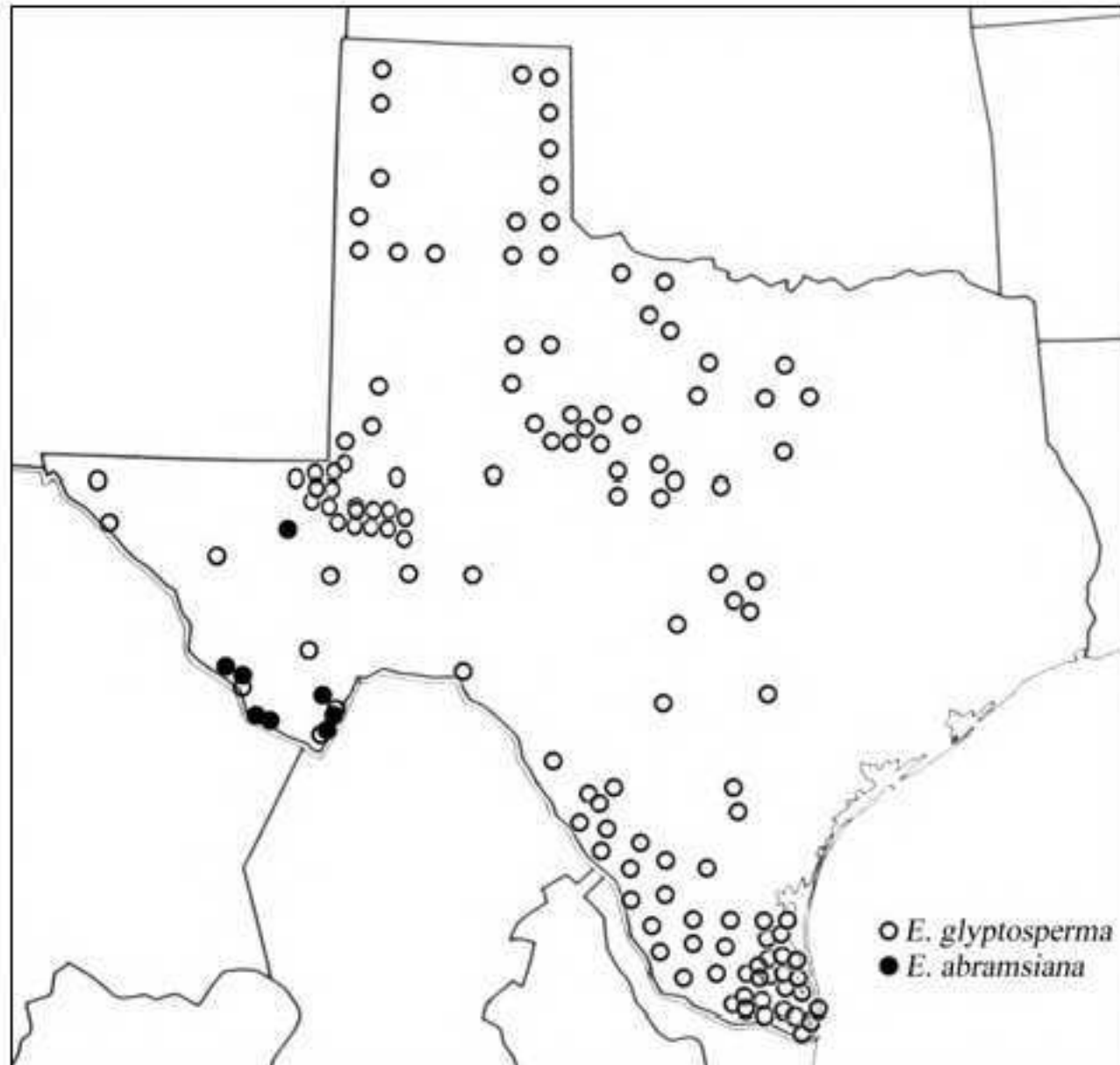


Figure 3. Distribution of *Euphorbia abramsiana* and *E. glyptosperma* in Texas (distribution of *E. glyptosperma* outside trans-Pecos Texas from Tumer et al. 2003).

Key to *Euphorbia abramsiana* and similar species

1. Upper stipules (those on the side of the stem facing upward or mostly upward) not united and mostly entire, forming 2 linear segments; lower stipules (those on the side of the stem facing downward or mostly downward) united into a single linear segment; seeds greater than 1.5 mm long, lacking markedly raised transverse ridges ***Euphorbia golondrina***
1. Upper and lower stipules divided, often into more than 2 linear segments; seeds less than 1.5 mm long, with or without transverse ridges.
 2. Stems usually ascending and somewhat winged, giving the plant a shriveled appearance; seeds smooth, pitted, wrinkled, or with low transverse ridges (Fig. 6) ***Euphorbia serpyllifolia***
 2. Stems prostrate (except in shade or dense competition with other plants), not winged; seeds with markedly raised transverse ridges.

- 3. Stems pubescent with short stiff hairs (often only basally); leaf blades often with pale stripes following the pattern of the pinnate venation in living plants; maculation interrupted, consisting of many small circular or irregular spots (Fig. 4); seeds concolorous, white; seeds with a protrusion at the chalazal end (Fig. 2A) **Euphorbia abramsiana**
- 3. Stems glabrous; leaf blades lacking pale stripes; maculation rarely present but, if present forming a single, continuous, linear spot along the midvein; seeds often slightly bicolorous when mature, with mostly light tan ridges and slightly paler areas (sometimes with a pale reddish tint) between ridges; seeds without a protrusion at the chalazal end (Fig. 2B) **Euphorbia glyptosperma**



Figure 4. *Euphorbia abramsiana*. Leaf blades often have pale lines in the position of pinnate venation and a central splotch broken into many smaller spots. A. Hot Springs Trail, Big Bend National Park, Texas, 12 Oct 2014. B. Tucson, Arizona, 7 Aug 2014.



Figure 5. *Euphorbia glyptosperma*. Leaf blades without lines or splotches. *Euphorbia glyptosperma* specimens from the Trans-Pecos often display characteristics similar to those of *E. abramsiana*, compared to *E. glyptosperma* specimens in other parts of Texas. A. Tomillo Creek, Big Bend National Park, Texas, 12 Oct 2014. B. Gaines Co., Texas, 5 Oct 2011.

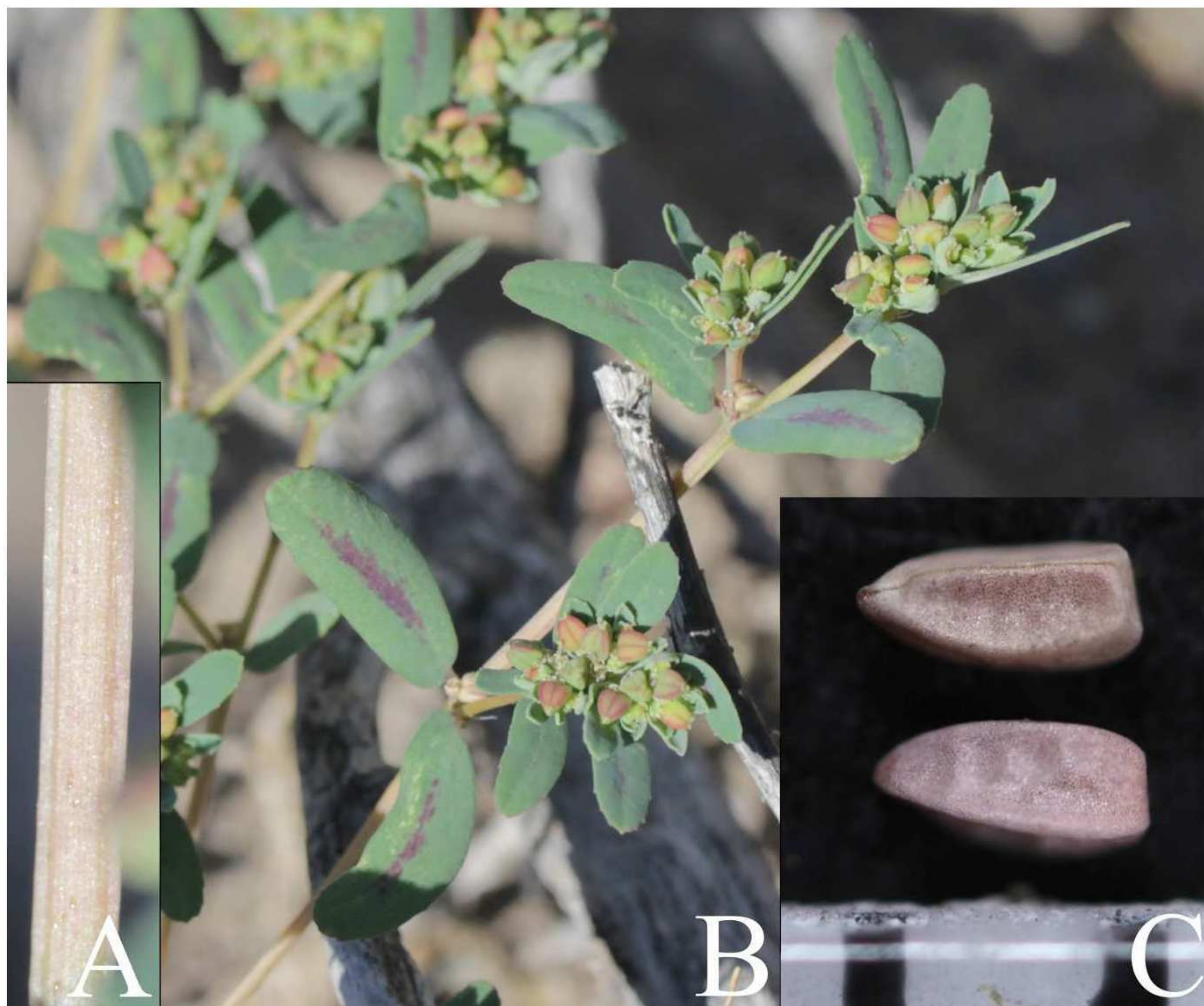


Figure 6. *Euphorbia serpyllifolia*. Stems usually ascending and winged; leaf blades with or without a continuous, linear splotch; seeds pitted, wrinkled, or with low transverse ridges. A. and B. Tornillo Creek, Big Bend National Park, Texas, 12 Oct 2014. C. Solitario Overlook, Big Bend Ranch State Park, Texas, 4 Sep. 2014, *Morey 182*. The distance between the two wide black vertical lines at bottom of figure is 1 millimeter.

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LITERATURE CITED

- Correll, D.S. and M.C. Johnston. 1970. *Manual of the Vascular Plants of Texas*. Texas Research Foundation, Renner, Texas.
- Jercinovic, E. 2007. The status of the genus *Chamaesyce* in New Mexico. *New Mexico Botanist* 40: 1–14.
- Steinman, V.W. and R.S. Felger. 1997. The Euphorbiaceae of Sonora, Mexico. *Aliso* 16: 1–71.
- Turner, B.L., H. Nichols, G. Denny, and O. Doron. 2003. *Atlas of the Vascular Plants of Texas*. Vol. I – Dicots; Vol. II – Ferns, Gymnosperms, Monocots. *Sida, Bot. Misc.* 24, 1 and 2.
- Wheeler, L.C. 1934. California *Euphorbia* Notes. *Bull. Southern Calif. Acad. Sci.* 33: 109–110.
- Wheeler, L.C. 1941. *Euphorbia* subgenus *Chamaesyce* in Canada and the United States exclusive of southern Florida. *Rhodora* 43: 97–154, 168–205, 223–286.